Lab Inventory Tracking System (LITS)

By

Megat Harizzuddin b Megat Hariri

Dissertation submitted in partial fulfilment of

the requirements for the

Bachelor of Technology (Hons)

(Information & Communication Technology)

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Universiti Teknologi PETRONAS

Bandar Seri Iskandar

31750 Tronoh

Perak Darul Ridzuan

CERTIFICATION OF APPROVAL

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Approved by,

_____
(Faizal Bin Ahmad Fadzil)

UNIVERSITI TEKNOLOGI PETRONAS
TRONOH, PERAK
MAY 2014

CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

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MEGAT HARIZZUDDIN BIN MEGAT HARIRI

ABSTRACT

This report discuss the currently research done on the project called Lab Inventory Tracking System (LITS)**.** With a promising results after a few test, it shows that LITS is a proven tools that help staff of IT-Media department of Universiti Teknologi PETRONAS (UTP) to manage and track the inventory efficiently. The objectives of the LITS are to provide a platform for the users in IT-Media department of UTP to manage and track the inventories. LITS can provide an auto-generated report or chart of the current status of the inventories for reporting purpose. The problem statement chapter discuss the difficulties faced by the staff in managing and tracking the lab's inventory when there are no centralize database to record all of the current lab equipment thus a report of an inventory status is difficult to produce. The literature review chapter discuss about the office automation that have been implemented in the department. The methodology describe the Software Development Life Cycle (SDLC) model used in the project development which is Rapid Application Development (RAD) and the tools used. All the findings and system designs of the project are details in this report. The recommendation and conclusion chapter will summarize the overall view of this project.

ACKNOWLEDGEMENT

First of all the author would like to express my thanks to Allah S.W.T for the blessing and strength that was given to me to complete this project. Not to forget, his parents and family members for their support, advice and understanding throughout the period of completing this project.

The author would like to express his most gratitude to his supervisor, Mr. Faizal bin Ahmad Fadzil and my co-supervisor Ms. Zullina Hussain Shaari for the guidance and supervision to assist the author throughout the process of completing this project. His input and feedback was very useful which gave a significance impact in this project.

A special thanks go to Ms. Azarina, Staff from IT Media department who is willing to collaborate with me in this project. Her expertise and input on lab inventory management of UTP really help me a lot in this project.

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TABLE OF CONTENTS

TABLES OF ILLUSTRATIONS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND NOMENCLATURES

LITS	Lab Inventory Tracking System (LITS)
RAD	Rapid Application Development
SOP	Standard Operating Procedure
SDLC	System Development Lifecycle
UTP	Universiti Teknologi PETRONAS
CIS	Department of Computer & Information Sciences
UAT	User Acceptance Testing
SDK	Software Development Kit
ITMS	IT Media Department

CHAPTER 1: INTRODUCTION

1.1 Project Definition

This project will cover a system that will be used by IT Media Department (ITMS) managing lab inventory. This system is used to manage, track and report the inventories managed by ITMS. This project is presented by a prototype before it is implemented in the actual environment.

1.2 Background

Every organization has a large number of inventories which they have to manage. The inventories also have different in types and specifications. Usually the inventory data is stored in hard copies or in spreadsheets which took a longer time to manage and track the inventory.

Now, most of the organization are automating their business processes. There are two factor that motivate the organization to automate their business process. First is to improve productivity of clerical and managerial office employees. Second is to increase the complexity of decision making and information needs(Jr. 1982). Inventory tracking also important for the organization to come out with a financial statement and audit.

Currently UTP is having a huge number of lab and inventory consisting software and hardware which are need to be managed. Department of Computer & Information Sciences (CIS) and ITMS have to manage all the inventories of the labs in block 01 and 02. Existing system used to manage the lab's inventory are incomplete in term of requirements and dissatisfaction of user on the user interface. This system is developed to enhance the current way of managing of lab inventories by automate the current business process.

1.2.1 Problem Statement

The problem statement of this project are:

- Difficulties to manage and track lab's inventory using existing system.
- Didn't have a proper overall reporting of inventory status.
- The current system is not user friendly

Currently CIS Department have 22 labs located in block 01 and 02 with 7 staff managing the labs. There are about 13 licensed software installed in the computer of each lab excluding the hardware. The first problem that will be faced when managing the lab is difficulties to manage the large number of inventories in these labs. The current practice used by the person in charge for each labs is by using spreadsheet. Currently, all the inventories are tracked and managed using a system named Asset ID tracking system. Although there are existing system to managed and track the system, the system still couldn't meet the intended user requirements. There are comments from the user at the current user interface of the system. The system is deployed but haven't operate at optimum level. The system use barcode to track each inventory.

The second problem faced when managing the labs is there is no proper reporting of the current status of the inventories in the labs. For instance, a report on the current status of the lab requested by the top level management. With the current practice, it will took a longer time to prepare the report. Sometime the report is not accurate, which could lead to an inaccurate decision making.

Based on my observation and feedback from users on the existing system, I found that the existing system is no user friendly. The learnability and usability of the system is reduced due to the system design which didn't meet the user expectation and requirements.

1.3 Objectives and Scope of Study

There objectives of this project are:

- To provide a platform for the staff to manage and track the inventories by using web based system.
- To provide an auto-generated report or chart of the current status of the inventories.
- Develop a user friendly system by develop an interface which improve the system learnability of the user.

The project scope define the boundary which will be covered by this project. This project allow user to manage and track the inventories in the labs.. All the data of the inventories will be stored in a centralize database which is accessible by the authenticated users through the software.

The target user of this software is the staff and student of CIS Department since they are the users which actively accessing the lab inventories in block 01 and 02. This group of users will have the most benefit from this software.

CHAPTER 2: LITERATURE REVIEW

2.1 Automated Office System

According to Michael Wohlwend, vice president of SAP Americas, the days of managing inventory using Excel spreadsheets are passed. As stated by Michael Wohlwend before most of the organizations are moving from managing inventory by using spreadsheet to automated system with a centralized database. Organization see this as an opportunity to simplify their business process and improve the efficiency of information processing. In office automation, the office work not only performed efficiently but it also change the concept of office work. Indeed by doing this is can reduce the number of steps in the standard operation procedure (SOP).

The effect of office automation is the individuals can productively contribute to organizational functioning regardless of their physical location. It is easier for the staff the data is always available as long there are internet connection. Physical limitations to changing organizational structures should be less critical since the communications capabilities become relatively independent of physical location (Olson & Lucas Jr., 1982). It also can lead to increasing of productivity and improving the quality of work life by changing the nature of organizational information processing. Based on a study done by Levina, it is was proven that there a reduced process time by 37.5% and reduced estimated costs by 17.3%.

2.2 Inventory Management System

Nowadays. Inventory Management System is widely used in major factories and shop to manage and track their resources. There existing inventory management system named Passport, it help organization improve their profitability through elimination of manual data entry and hardcopy files. It is integration between software and hardware which barcode technology is used to track inventories.

In a survey done by Eckert to retailers and a distributor, the author conclude that "Improved inventory management lead to improve customer satisfaction". For distributor, after implementing inventory management system for 6 months, the distributor able to predict the demand accurately and able to restocked at the right time. For retailers, they were able to identify the high demanded product and avoiding the product from out of stock.

2.2.1 Technologies

Barcode and RFID technologies are widely used in inventory management by various organization to track and manage their inventories. Both technologies automate the data collection process. Both technologies have different in many areas. Table 1 show the comparison between RFID and barcode technology.

	RFID	Barcode
Line of Site	Not required (in most cases)	Required
Read Range	Passive UHF RFID: • Up to 40 feet (fixed readers) • Up to 20 feet (handheld readers) Active RFID: • Up to 100's of feet or more	Several inches up to several feet
Read Rate	10's, 100's or 1000's simultaneously	Only one at a time
Identification	Can uniquely identify each item/asset tagged.	Most barcodes only identify the type of item (UPC Code) but not uniquely.
Read/Write	Many RFID tags are Read/Write	Read only
Technology	RF (Radio Frequency)	Optical (Laser)
Interference	Can interfere with other RF Frequencies.	Obstructed barcodes cannot be read.
Automation	Most "fixed" readers don't require human intervention	Most barcode scanners require a human to operate.

Table 1: RFID vs Barcode Technology

Table 1 show the differences between RFID and barcode technology. Barcode is widely used in inventory tracking in the industries because of it is cheaper than RFID. In some circumstances, RFID offer more advantages than barcode in term of line of sight technology. RFID system provides not only identification information, but also location information in real time (Ohashi, Ota, Ohno-Machado, & Tanaka, 2008). According to RFID Journal, RFID is 15-20 times faster than barcode processes for inventorying IT assets. Some organization experience a 95% reduction in time using RFID (Hellstrom, 2009).

There are two types of RFID which are active and passive. In term of cost, passive RFID is cheaper than the active RFID. Active RFID need power adapter compared to passive RFID. The range of active RFID is far better than the passive RFID which is up to 300 feet. Tag life of a passive RFID tag can reach up to 10 years and active RFID tag life is between 3 to 8 years depending on the broadcast rate (Shukla & Radadiya, 2013).

RFID is chosen to tracks inventories because it can read multiple tags simultaneously. It also does not require a line of sight and can improve the process by reducing man-power. The value in RFID can be reused many times.

CHAPTER 3: METHODOLOGY

3.1 Introduction

Methodologies mean ways of how the process of the system will be made. There are several SDLC design which suitable to be implemented in development of this system. .The time to develop this system is 7 months. The suitable SDLC model to develop this system is Rapid Application Development because it use minimal planning and focus more on prototyping. The planning will be interleaved with the development of the software. The software can be developed much faster and it is easier to change the requirement.

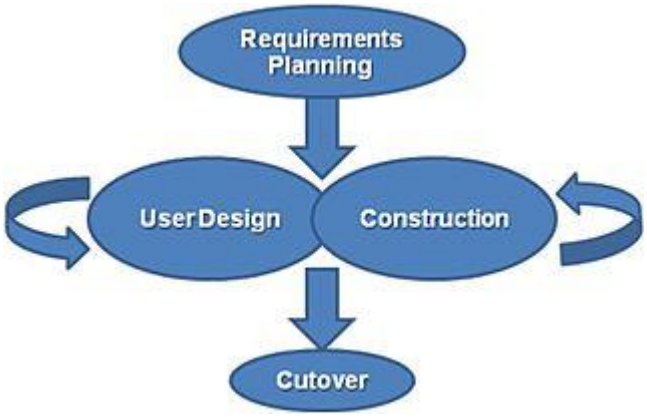


Figure 1: Rapid Application Development (RAD)

3.1.1 Project Phases

Phase 1: Requirement Planning

In initializing phase, all requirements related to the application are gathered. Application requirements is divided into two which are business requirements and system requirements. It is important to understand the current standard operating procedure (SOP) used by the staff before the system requirements can be identified. The requirements are gather trough meeting with the user on their expectation on the

application. Below are the activity diagram for one of current SOP for Inventory Purchase:

From the meeting with the user, I have identified a few requirement from the user which need to be include as the system function. In the requirements, I have identified three type of user in this system which is administrator, contributors and viewer. Each user will have the own role in this system.

Phase 2: User Design

Design of this project is divided into 3 parts which are Concept Design, Architecture Design and User Interface Design. Concept design will give basic concept based on the requirements gathered in the first phase. While, architecture design give the overall architecture of this system. User Interface design is important to ensure the user is pleased with the look & feel of the system. User Interface need to be design based on the requirements and need to be tied with the functional of the system. The users will continuously participating in this process as they will review the design of the application to ensure it meet their requirements. Figure 3 below show the proposed architecture of the system. The data the will be stored in a centralized database which is accessible by the others.

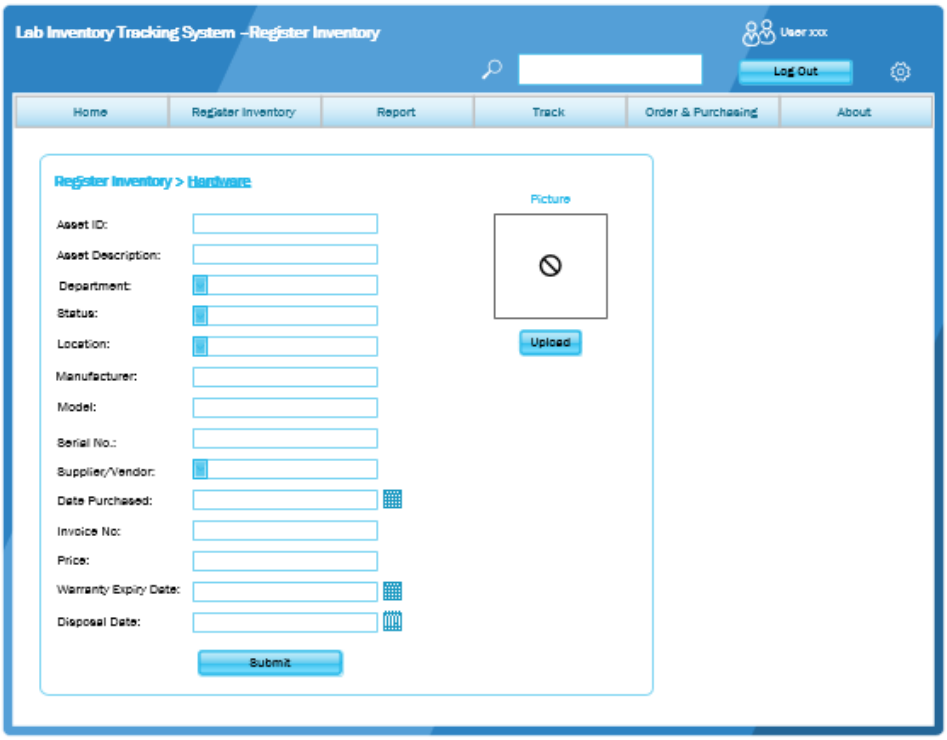


Figure 2: Wireframe Diagram

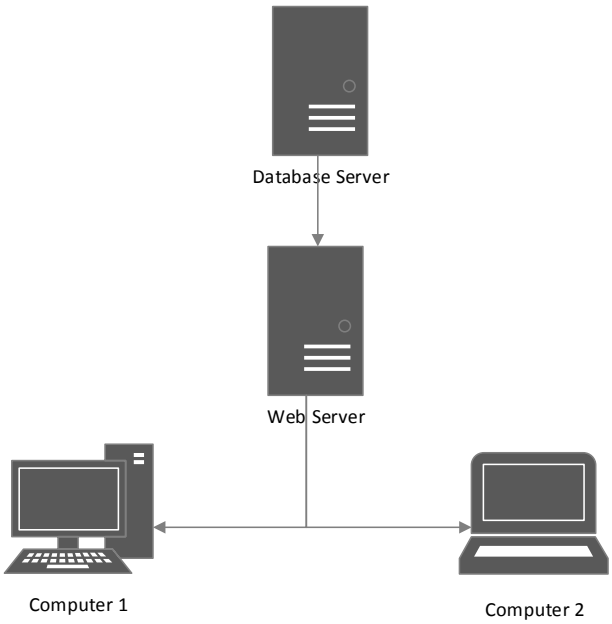


Figure 3: Proposed Architecture

Based on the use case and the user requirements of the system, I was able to come out with the database schema of this system. The inventory is categorized into two which is hardware and software. Both categories shared same attributes.

Phase 3: Construction

After all the designs are finalize, the application is ready to be developed. In this phase, the main software will be used to develop the system is PHP, MySQL and jQuery. The application will be developed based on the design of the application to make sure it will meet the requirements. With user involvement in this phase could help to minimize the probability of requirement changes after the application is being deployed. Design of the system could be changes as the development is ongoing. Unit testing and Integration Testing will be done when each component is developed to ensure the system functioning as intended.

Phase 4: Cutover

Cutover is the delivery of the new system to its end users. This phase will include data conversion and User Acceptance Testing (UAT). UAT is done with the users as the user testing the prototype to identify bugs or changes that need to be made. Users will be given several test case for user to execute provided by the developer. The application will be deployed after the system meet the requirement and there is no changes needed. This application is simple and user will learn on how to use the application as they run through the application.

3.2 Required Tools

Several tools and requirements that involved in the system development. Below is the requirements and tools required:

- Personal computers
- WYSIWYG Web Builder 8
- Adobe Photoshop CS5 (used for design)
- Microsoft Visio 2013 (to develop UML Diagram)
- Notepad++

3.3 Gantt Chart

Below are the Gantt chart and timeline of the development of the project throughout this semester:

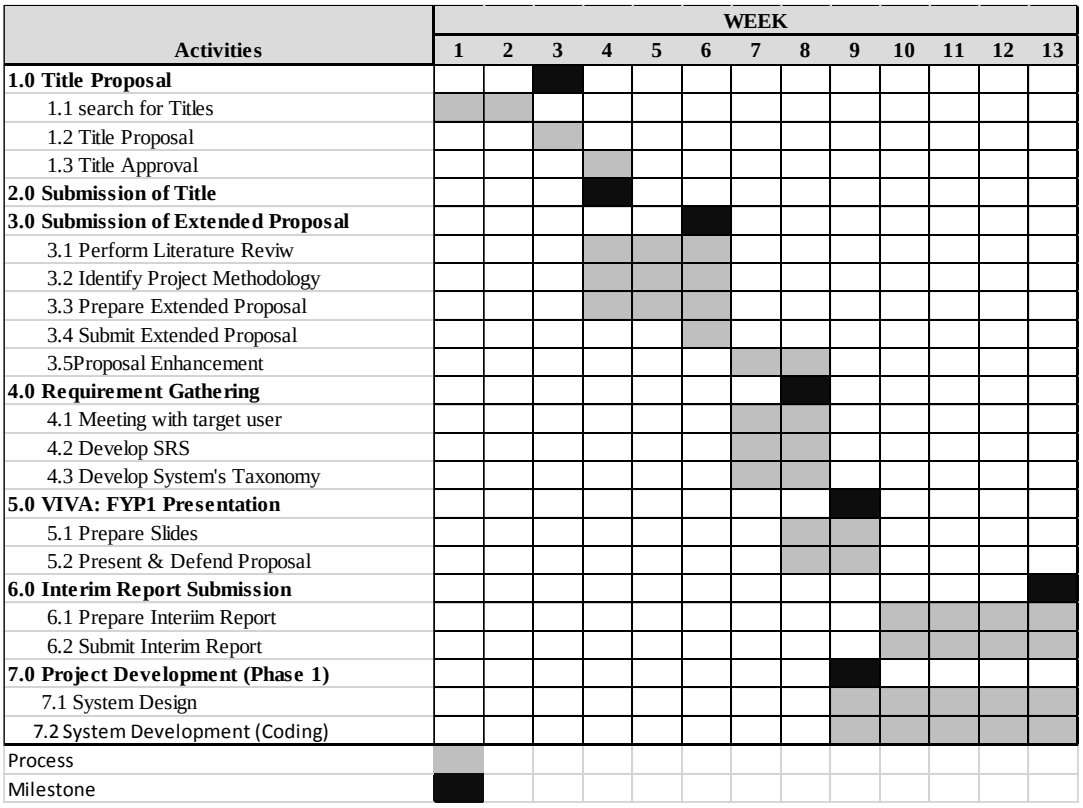


Figure 4: FYP I Gantt Chart

Activities	WEEK													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.0 Progress Report														
1.1 Prepare progress report														
1.2 Submit to SV														
2.0 Project Development (Phase 2)														
2.1 System Design														
2.2 System Development (Coding)														
2.3 Testing														
3.0 PRE-SEDEX														
3.1 Prepare Poster														
3.2 Prepare Presentation														
4.0 Update Report														
4.1 Prepare dissertaion														
4.2 Review disertation														
4.3 Prepare Technical Paper														
5.0 Report Submission														
6.0 VIVA: FYP1I Presentation														
Process														
Milestone														

Figure 5: FYP II Gantt Chart

CHAPTER 4: RESULTS & DISCUSSION

4.1 LITS Site Map

There are there type of user in this system which are the system administrator, Contributor and Viewer. Each user have different access level. For instance, administrator will have the overall control of the system, contributor can contribute and edit informations to the system and viewer will have restricted access to the system which is view only. Below is the conceptual web site diagram of the system.

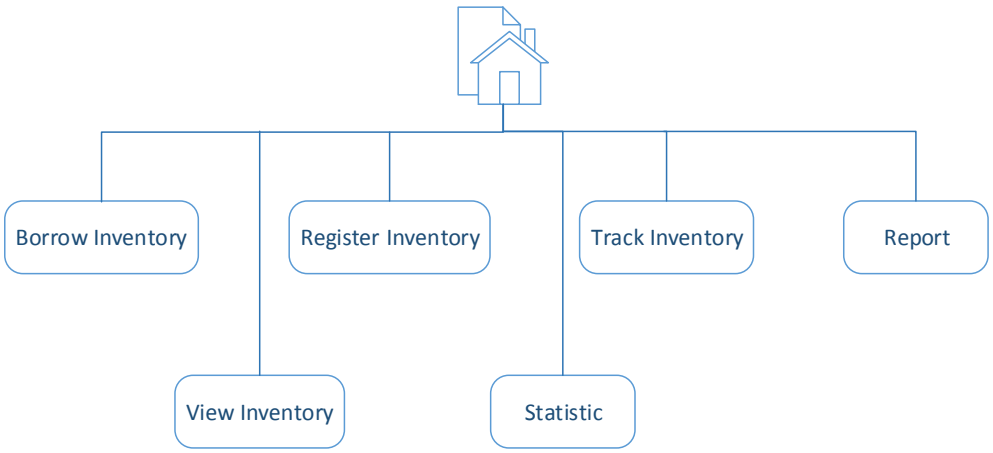


Figure 6.0: Conceptual Web Site Design

The system will a have 6 pages excluding homepage. **Borrow inventory** page will integrate with the RFID reader interface which identified the equipment borrowed by the staff or students. The RFID reader is placed at the door of the lab. Once the reader detected the equipment it will prompt a required details of the borrower before a confirmation is made. **Register Inventory** page is accessible by the contributors and the administrator, where the new equipment is registered into the database. **View Inventory** will display all the inventory information registered in the system. In **Track Inventory** user will able to track the location and status of the inventory by the ID of the equipment. User will be able to view the overall report of the equipment status in the **Report** pages and user will be able to report any defect with the equipment. **Statistic** page will display all the statistics and report generated by the system.

4.1.1 Use Case Diagram

Based on all requirements gathered in the requirement analysis phase, a high level design of the system is developed. A use case is constructed by identifying the main functions of the system described during the requirement analysis. The system will have three actors which have different access level of the system.

Figure 7: Use Case Diagram of the system

4.2 Database

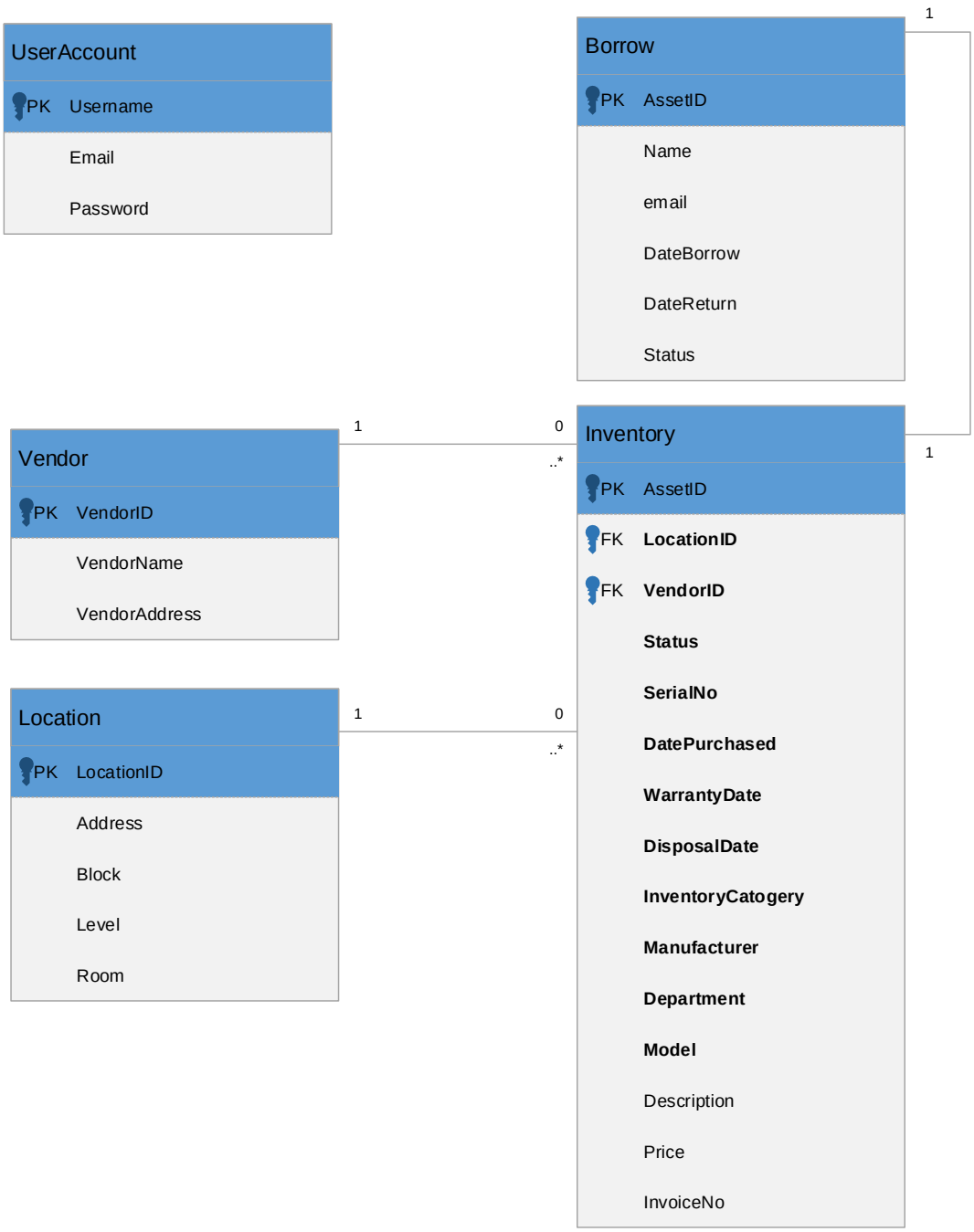


Figure 8: Class Diagram for Database

In this project there is one centralized database is used. Figure 8 shows the class diagram for the system. The database consist of five tables which are the UserAccount where the Username is the primary key which is used in login to the system. Then, we have Department where the DepartmentID as the primary key, Vendor with Vendor ID as the primary key and Location with LocationID as the primary key. For Borrow, AssetID will be the primary key. All of these three tables have one to many relationship with the InventoryDetails table where the AssetID is the primary key.

Department, Vendor and Manufacturer will have a one to many relationship with the Inventory table. Some of the inventory will have the same vendor, manufacturer and assigned department. User Account doesn't have relationship with other tables as it is used for system credentials.

4.3 Lab Inventory Tracking System (LITS)

4.3.1 Users Access

There three type of users that have access to the system: (i) Viewer, (ii) Contributor and (iii) Administrator. This will ensure the security of system and the authenticity of information in the system. Each user have different level of access as described in the table below:

	Viewer	**Contributor**	**Administrator**
Register Inventory	R	C,R,U,D	C,R,U,D
Track Inventory	R	C,R,U,D	C,R,U,D
Statistic	R	R	R
View Inventory		R,U,D	R,U,D
Borrowing		C,R,U	C,R,U
Report	C	C,R,U	C,R,U
System Management			C,R,U,D

R = Read, C = Create, U = Update, D = Delete

Table 2: User Access description

4.3.2 Homepage

Figure 9: Home page for viewer

Figure 9 show the interface of the home page. The homepage of LITS is accessible without login to the system. In the home page user will have four menu: (i) Home, (ii) Track, (iii) Statistic and (i) Report. There a carousel on the middle part of the page where it will display the latest information and announcement related to the system. On the bottom part of the page there is two option for the user where the user can login to the system if they have an existing account or register a new account to access the system.

Figure 10: Home page for contributor

Contributor have a privileges to update the inventory information in the system. User with contributor access will have different homepage when login to the system account. User will be able to more access to the system functions. The system functions that user will be able to access are: (i) Register inventory, (ii) Track inventory, (iii) Statistic, (iv) View inventory, and (vii) Borrowing.

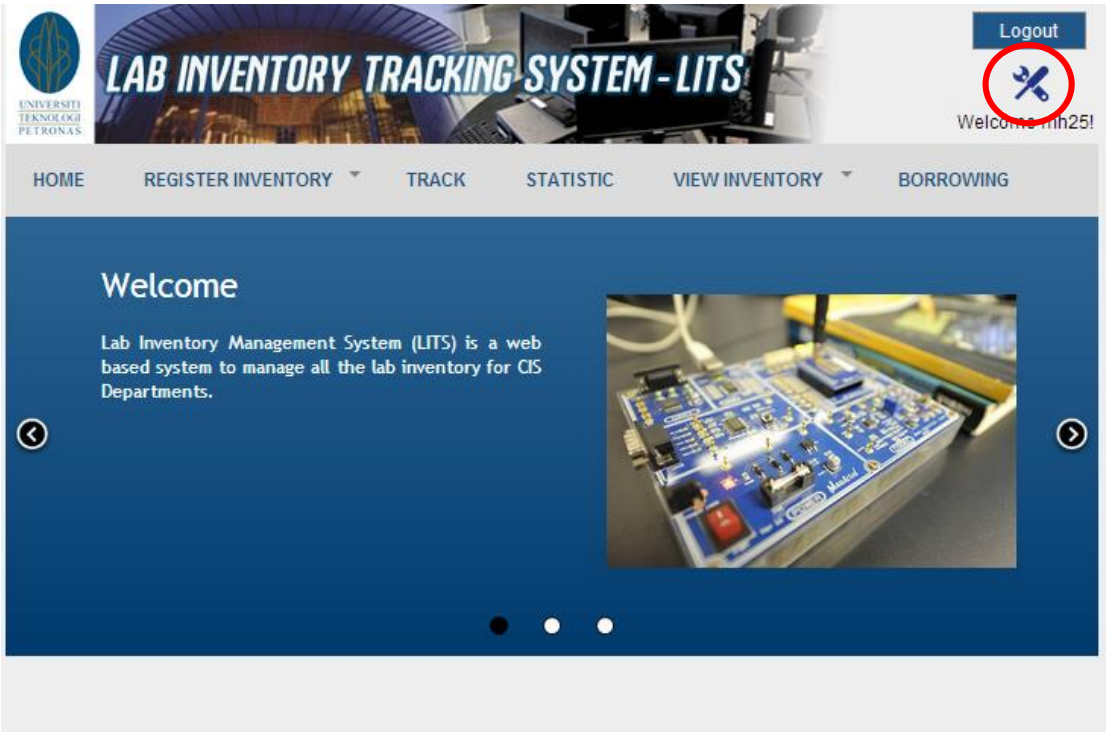


Figure 11: Home page for administrator

User with administrator access will have different homepage when login to the system account. User will be able to access to all system functions. The system function that user will be able to access are: (i) Register inventory, (ii) Track inventory, (iii) Statistic, (iv) View inventory, and (v) Borrowing, and (vi) System management (with red circle).

4.3.2 Register Inventory

IT Media Department managing two type of inventory which are hardware and software. For register inventory, user will have two option: Hardware and Software. Each inventory will have an unique ID which is used to identify each inventory.

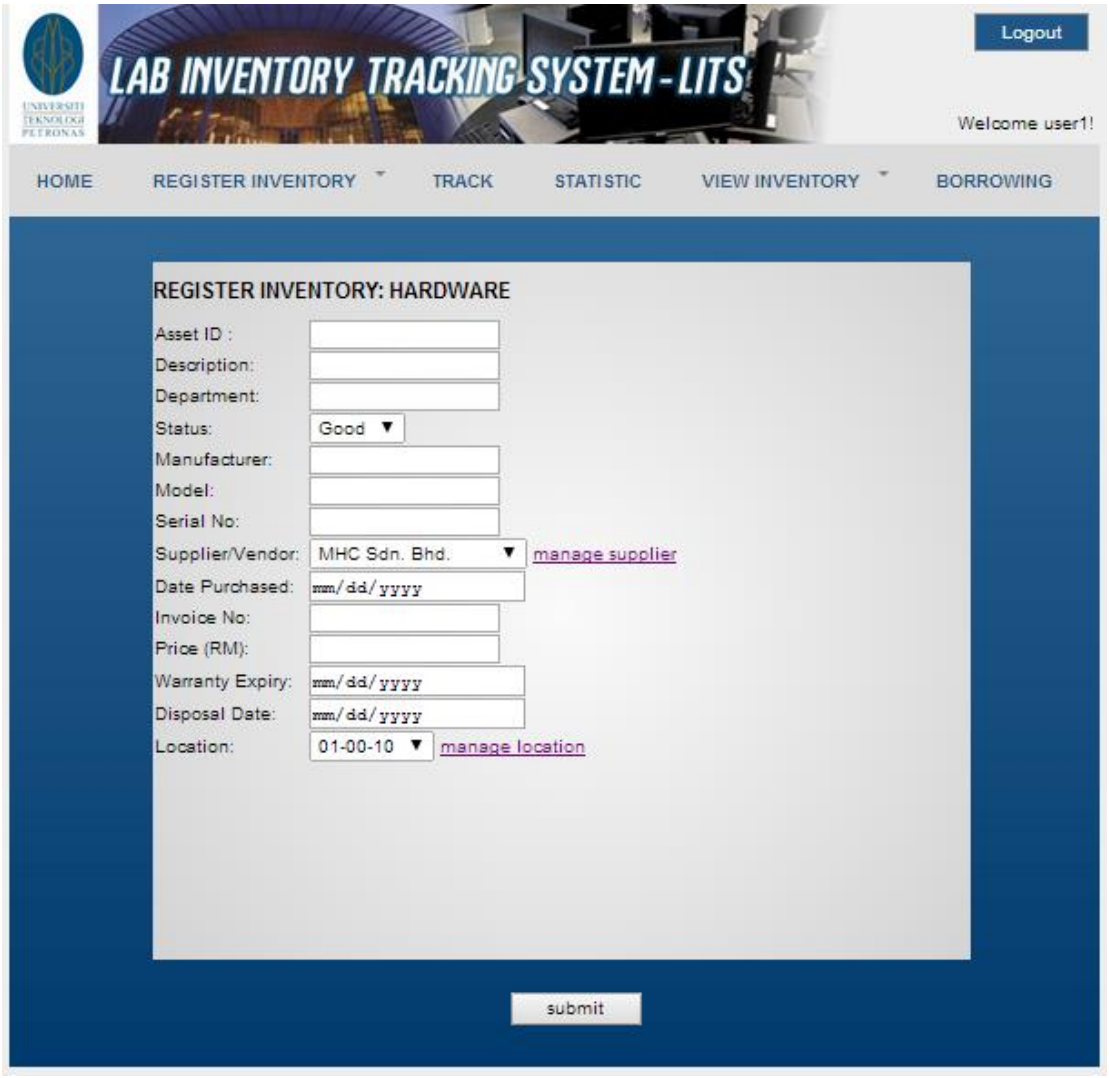


Figure 12: Register Inventory (Hardware) page

In the register inventory details, user will be able to register or add new inventory to the database. Each inventory is represented with Asset ID which differentiate each inventory with another. The input is specified according to the user requirements. User need to enter all the inventory details of each fields. For supplier and location input field, user will have an option where they can add a new supplier or location information to the system. Table 3 describes each fields in details. After all the field is completed, user need to click submit to send the data to the database. All the input will be stored in the database.

Fields	Description	Input field
Asset ID	Unique ID for inventory	Text
Description	Brief description of the inventory	Text
Department	Department assigned for the inventory	Text
Status	Current Status of the inventory	Drop down
Manufacturer	Manufacturer/Brands of the inventory	Text
Model	Model of the inventory	Text
Serial No.	Serial No. of the inventory	Text
Supplier/Vendor	Suppler or vendor for the inventory	Drop down
Date Purchased	Purchase date of the inventory	Date picker
Invoice No.	Invoice number for the in inventory purchasing	Text
Disposal date	Date of the inventory to be disposed	Date picker
Location	Location of the inventory	Drop down

Table 3: Input field description - Hardware

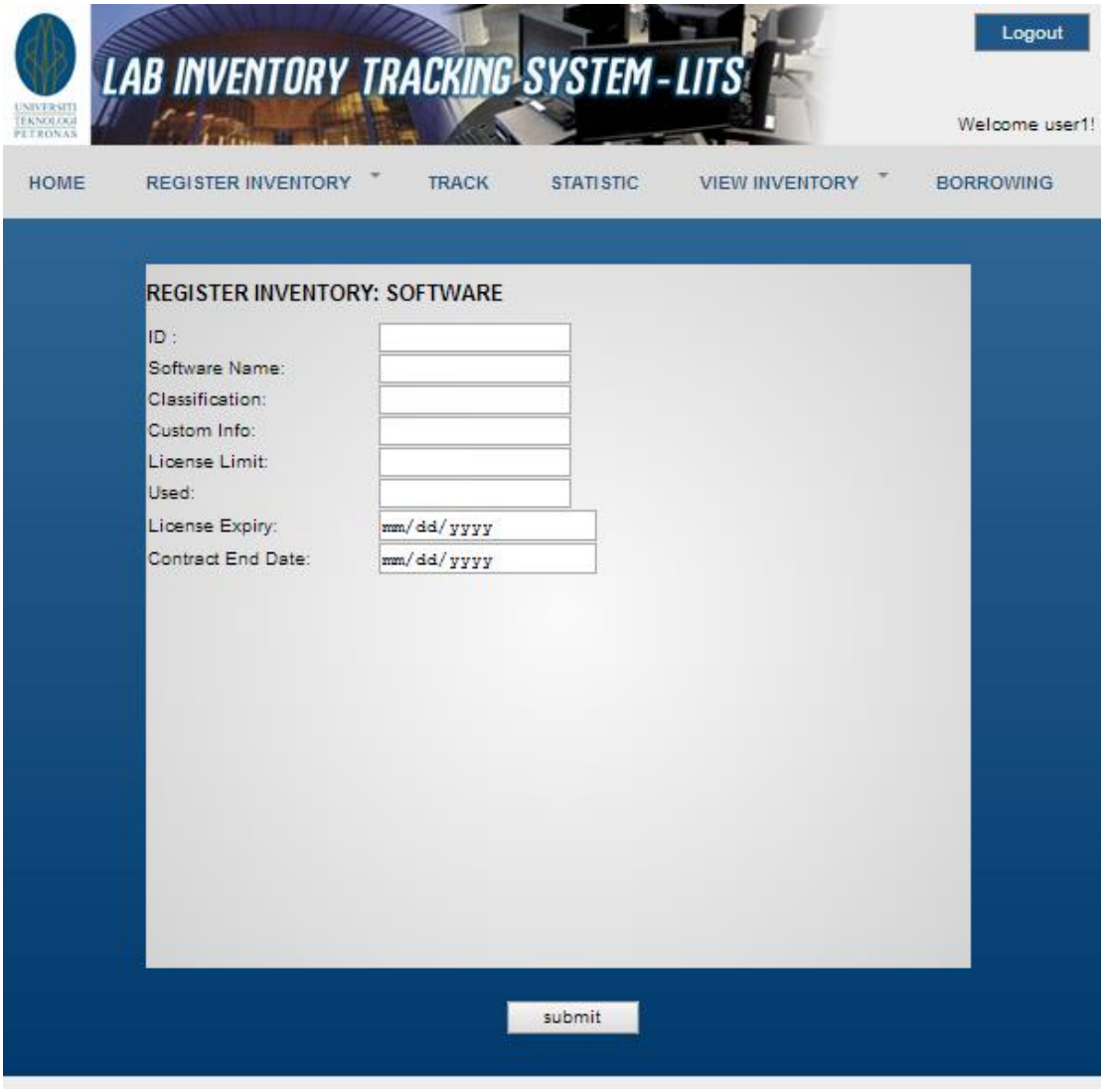


Figure 13: Register Inventory (Software) page

For new software registration, user will be prompted with different input field compared to hardware. User need to enter all the inventory details of each fields. Table 4 describe all the fields in details. After all the field is completed, user need to click submit to send the data to the database. All the input will be stored in the database.

Fields	Description	Input field
Asset ID	Unique ID for inventory	Text
Software Name	Name of the software	Text
Classification	Type of software	Text
Custom Info	Other unique information of the software	Text
Licensed Limit	Number of license available	Integer
Used	Number of license used	Integer
License Expiry	Date of license expiry	Date
Contract End Date	Date of contact end	Date

Table 4: Input field description - Software

4.3.3 Track Inventory

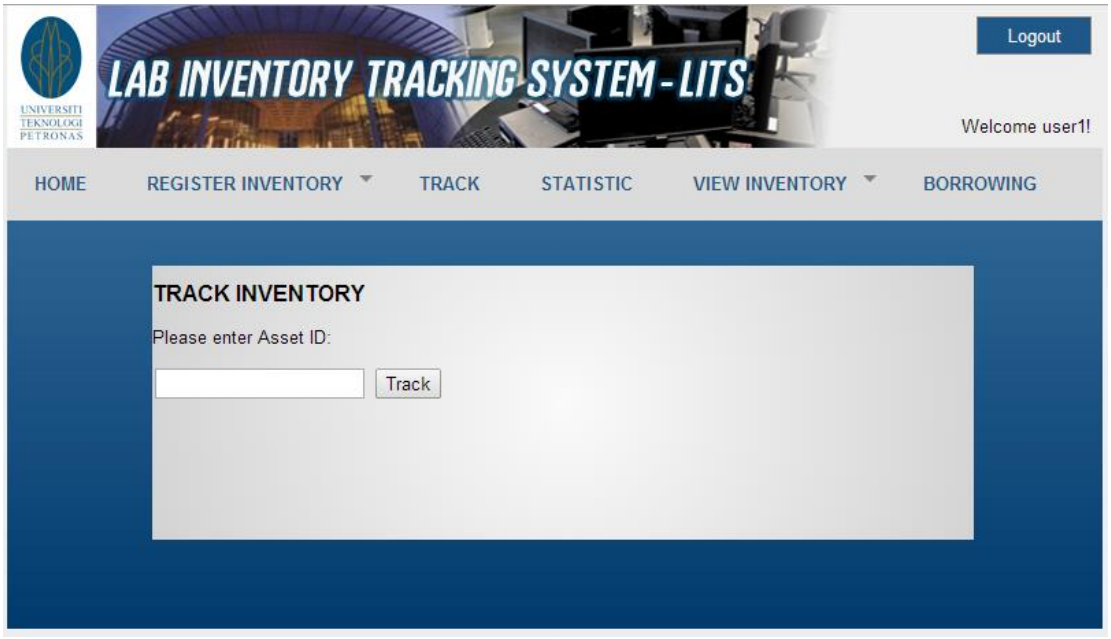


Figure 14: Track Inventory page

This system allow user to track back the inventory registered to the system by unique asset ID. Track inventory page is accessible by all user. For contributor and administrator, they will be able to track and update the inventory information. Figure 15, show the track inventory result page. All the information displayed and user will be able to alter and update the information. User with viewer access can only view the inventory information.

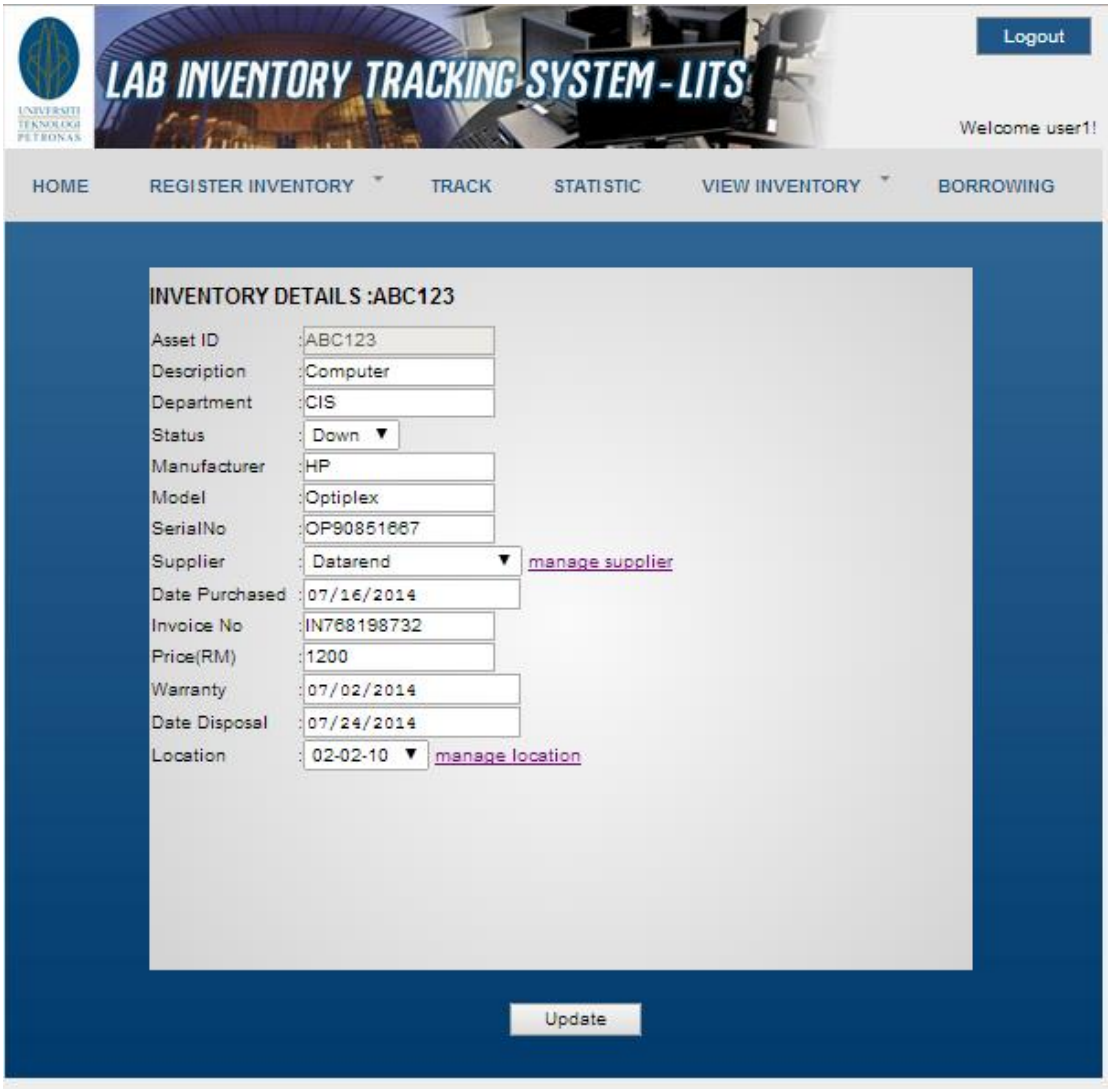


Figure 15: Track Inventory result page

4.3.4 Statistics

In Statistic page, all overall information will be displayed here. This page is accessible by all type of users. This page is design to provide a high level reporting for all inventory registered to the system. This system will update and generate report automatically. The information will presented in a graph and chart format.

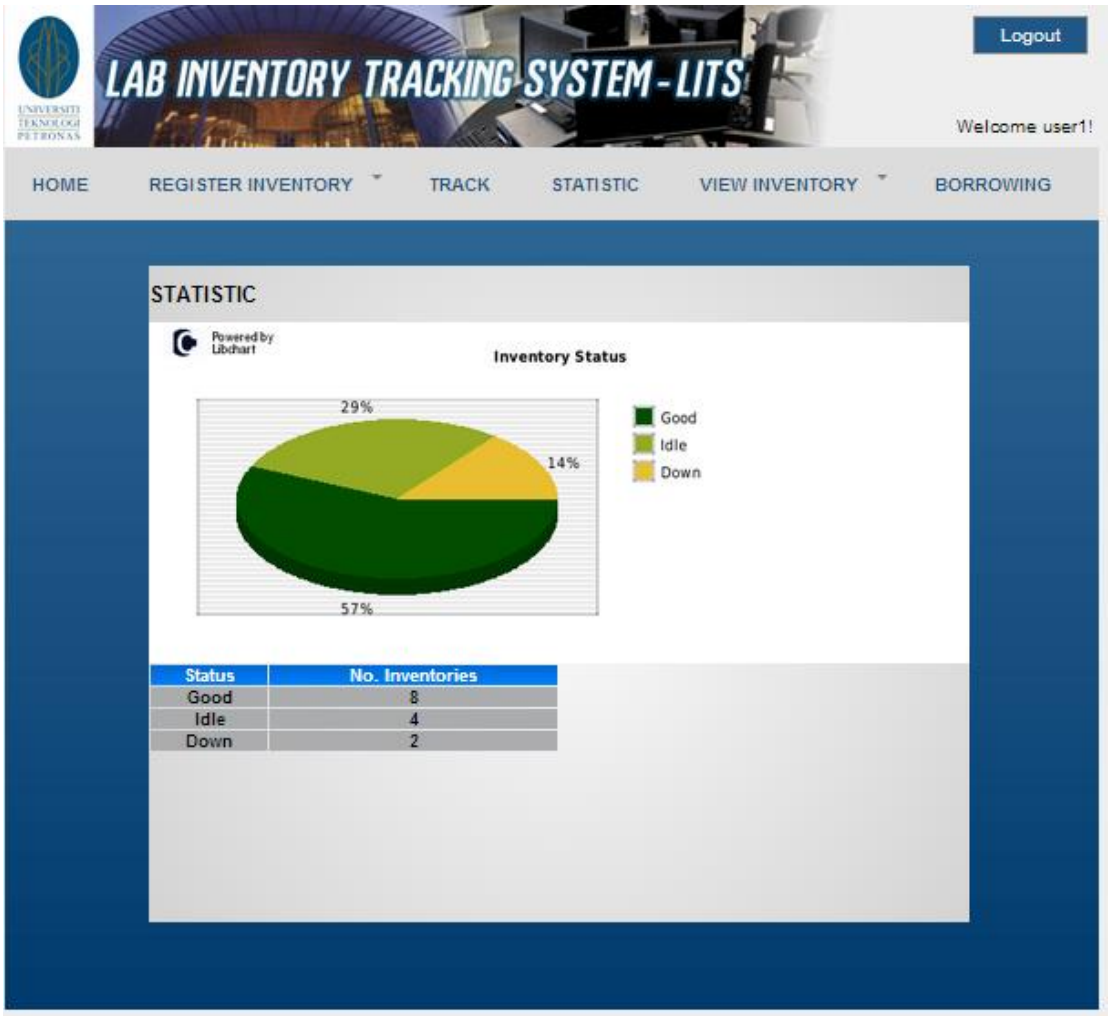


Figure 16: Statistic page

4.3.5 View Inventory

For view inventory page, there will be two categories to be choose: Hardware and Software. It will display the whole list of inventory registered to the system. Each page will display 10 items per page. It will only display asset ID, status, manufacturer, model, and location. User will also be able to edit or remove the selected item feom the system.

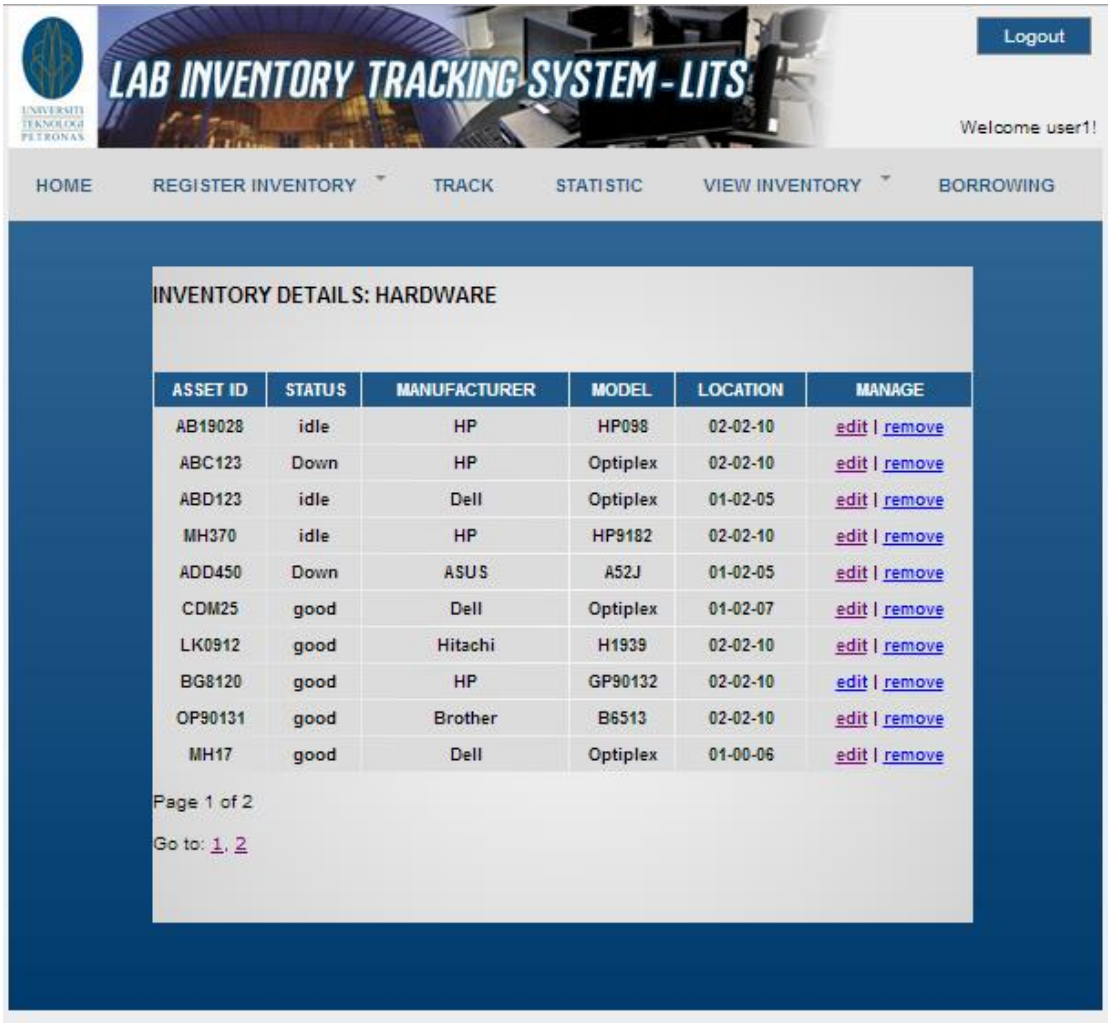


Figure 17: View inventory - Hardware

4.3.6 Borrowing

Borrowing is a function where user create and view the information of inventory borrowing by the staff and student of UTP. The system will display the inventory ID, name of borrower, status, borrow date and return date. User can update the status of a borrowing whether it is borrowed, returned and missing.

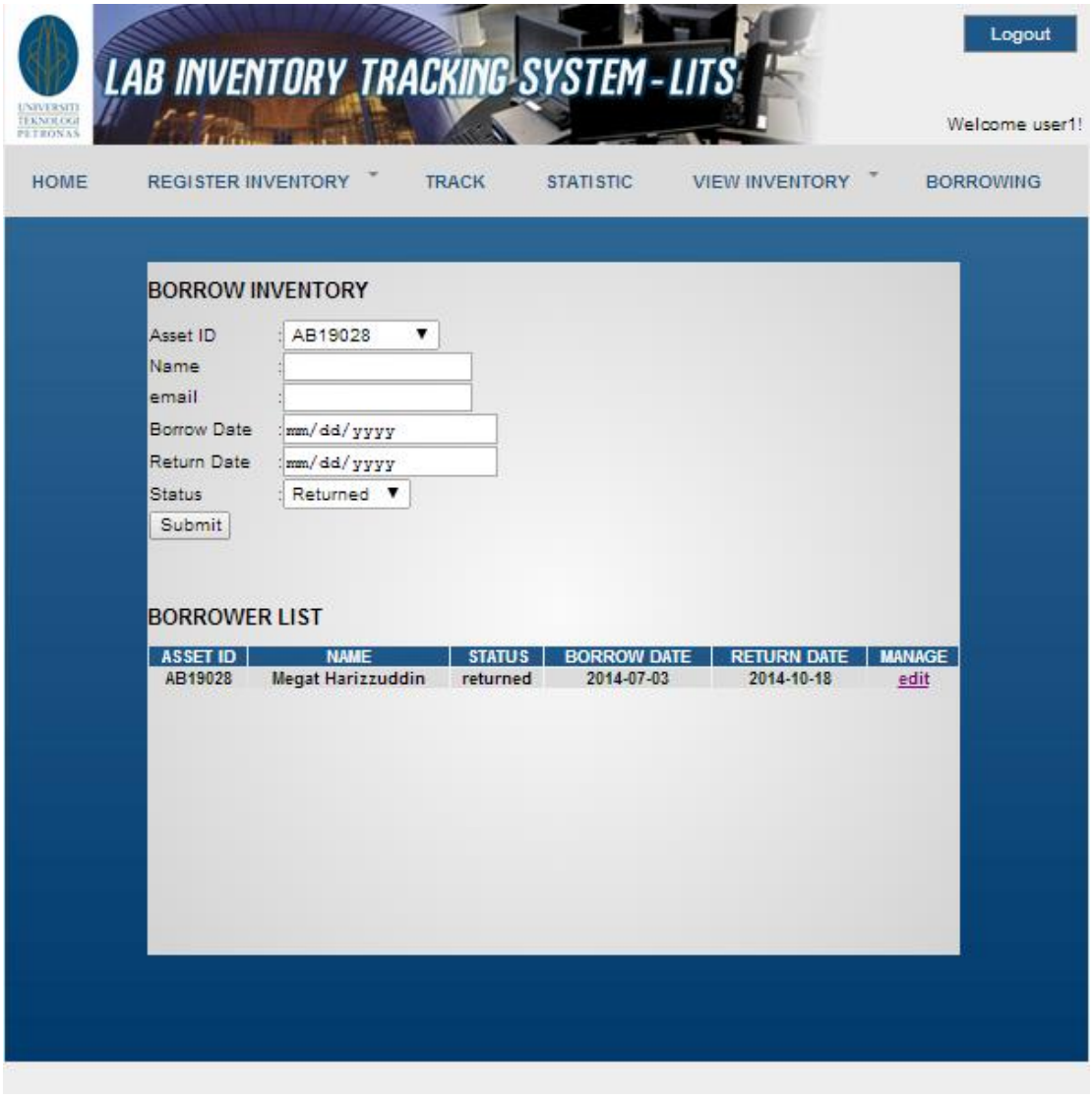


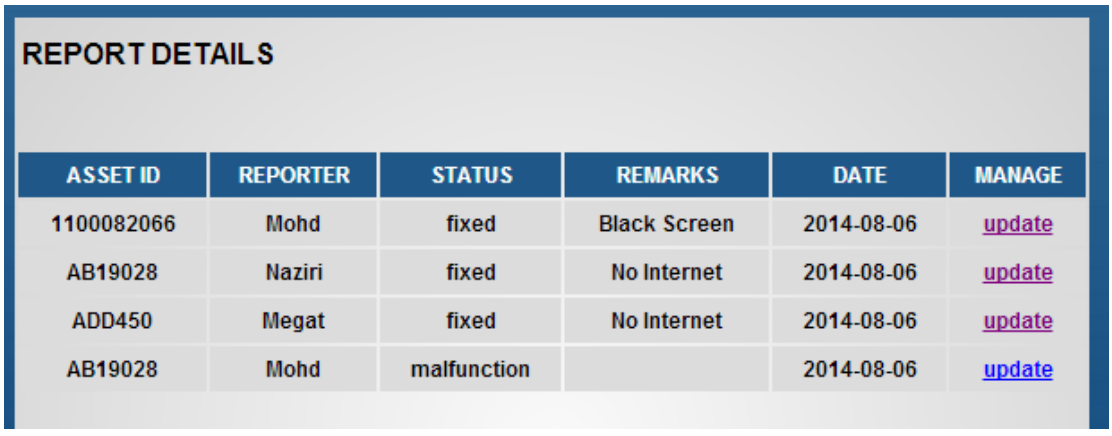
Figure 18: Borrowing page

4.3.7 Report

Report is a function where user can report faultiness on an inventory. The function is accessible with viewer access. User will be prompt for to the defected inventory ID, reporter's name, e-mail and remarks. The information will be registered to the system.

Figure 19: Report page

Administrator can view the reported faultiness so a further action could be taken. The status of the report will be updated once the necessary action is taken. Figure 20 show the reported faultiness to the system.



ASSET ID	REPORTER	STATUS	REMARKS	DATE	MANAGE
1100082066	Mohd	fixed	Black Screen	2014-08-06	update
AB19028	Naziri	fixed	No Internet	2014-08-06	update
ADD450	Megat	fixed	No Internet	2014-08-06	update
AB19028	Mohd	malfunction		2014-08-06	update

Figure 20: View Report page

4.3.8 System Management

System Management is a function where system administrator able to manage the system. In function, administrator will be able to manage user, manage supplier. Manage location and view faultiness report.

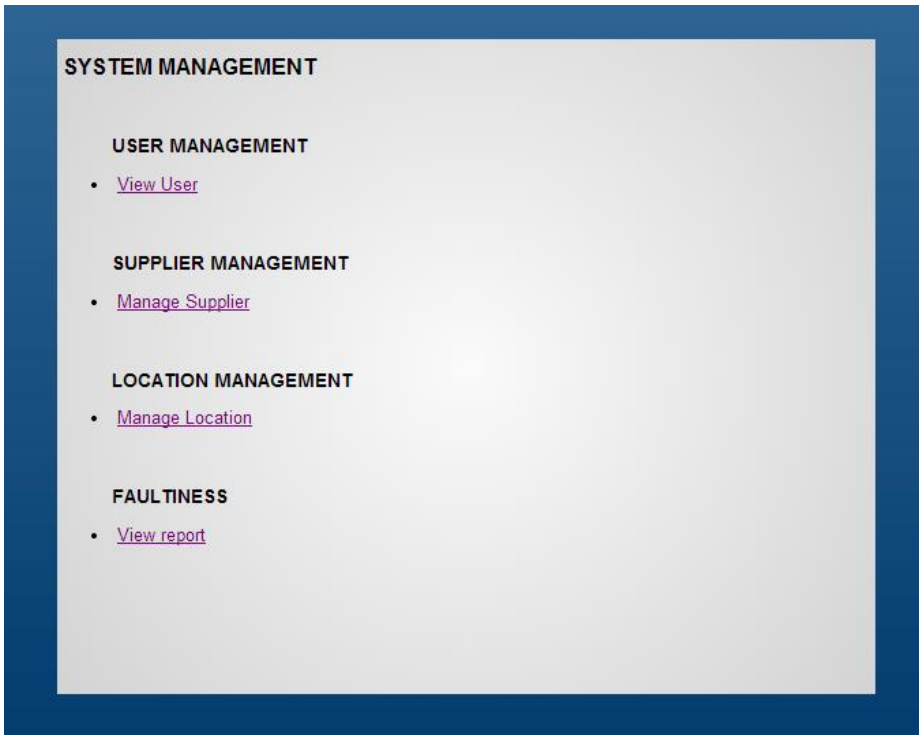


Figure 21: System Management page

In user management, user will be able to manage all the system user: (i) add user, (ii) remove user and (iii) update user information. System will display a list of user in the system and administrator will have option whether to add, remove or edit user information.

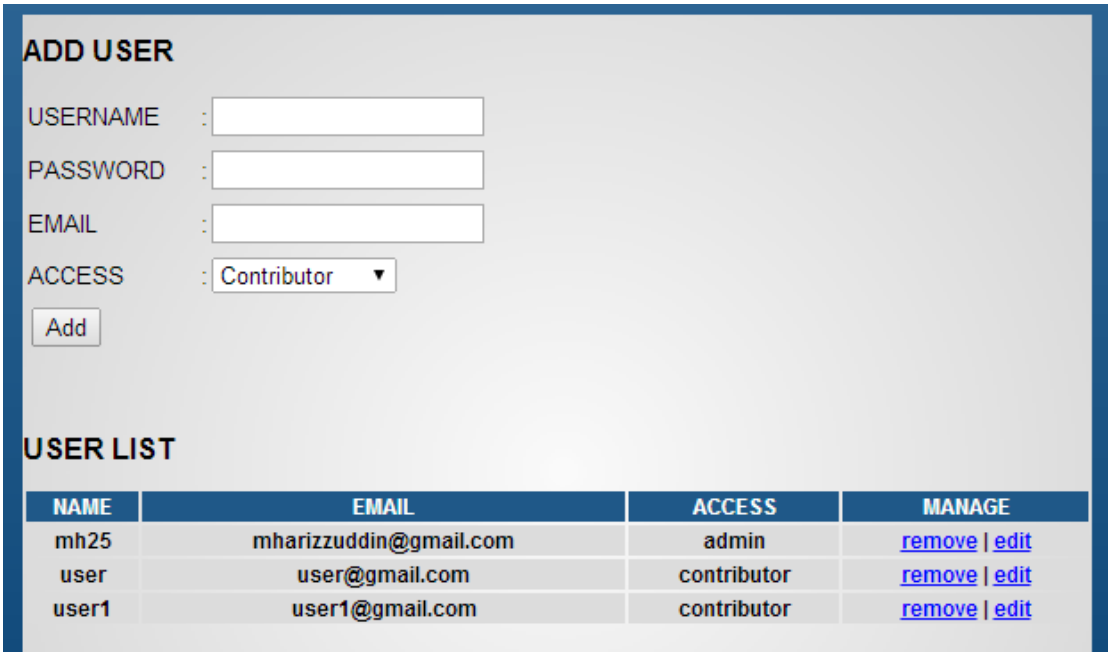


Figure 22: User Management page

User also will be able to manage supplier and location trough system management. User can add, remove and edit any supplier or location information in the system.

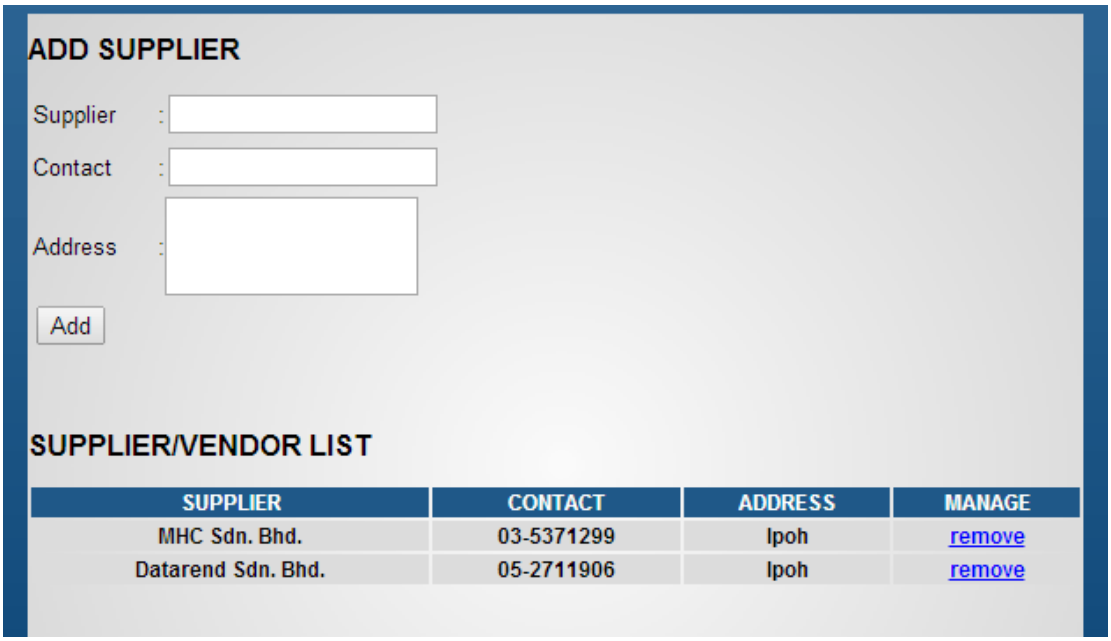


Figure 23: Manage Supplier page

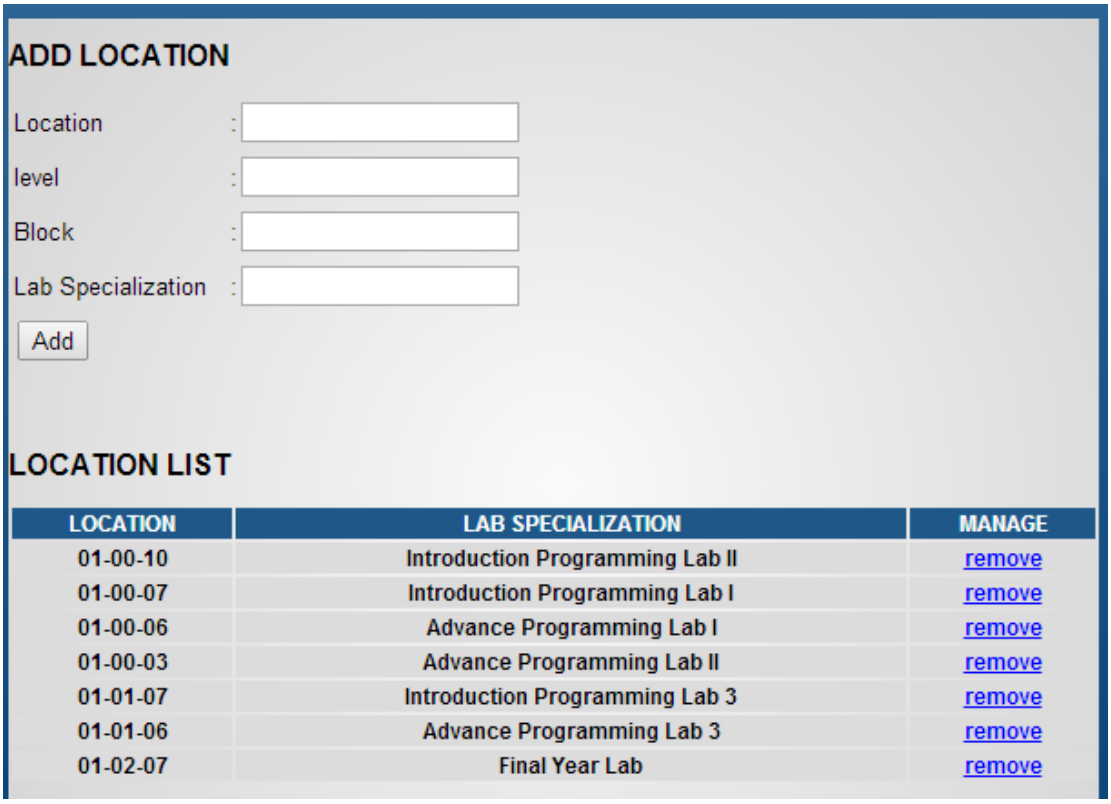


Figure 24: Manage location page

4.4 Discussion

The requirement analysis have been done by gathering all the required information through user interview, observation and walkthrough on the existing system. There several challenges that is need to be overcome in order to achieve the objectives of this project.

Information in the auto generated report varies with the users. Each user have their own perspectives on the overall view of the inventory information. Dome users would like to see the overall report on the status while other would like to view the inventory which beyond the disposal date. It is not easy for developers to suit each report according to the user perspective, where the report generated must be flexible and dynamic.

Human intervention is still importance to the system. Not all information can be validated by the computer or the system. Therefore, some of the information still need to be validated manually. In this system, whenever a RFID read a tag it will prompt a pop-up for confirmation of the in and out of the inventories. This is to ensure the equipment is authorized to be brought out form it location.

In the end of this project, all the problem discussed above should be solved to achieve the objective of this project.

CHAPTER 5: RECOMMENDATION & CONCLUSION

There several recommendations that need to be accounted for as it will help the improvement of the project throughout the development process. The recommendation wouldn't effect much to the current development.

Implementing RFID technology together with the system which could improve the efficiency of the system. It will eliminate manual entries and RFID able to track and identify the inventories much faster. The limitation is the cost to implement this technology which is high.

One of the recommendation is to gather and identify the business requirements of the software in more specific and understand how the current standard operating procedure (SOP) of the current lab inventory management work. It is to ensure the system developed is developed within the scope. Understanding the requirements is the most integral part in developing a system or software. It will affect the entire process if it is not done well.

As a developer of the system, try to eliminate assumption when designing and developing the system. To reduce or eliminate this, we need to done some review with the users in each stages or phases. This is to ensure all things are clarified by the users to eliminate ambiguities when developing the system. User involvement throughout the system development is important to improve the efficiency of system development.

As conclusion. I hope that this system can benefit it user by simplify their business process and increase the efficiency of lab inventory management. This extended proposal describe abstract, background of study, problem statements, and objectives of this system development. It also describe the methodology that will be used to develop this system. At the end of the stages, the system should achieve all the objectives and solve the problem statement mentioned above.

REFERENCES

Aykut , A., L, L. H., & Özalp, Ö. (2009). If the Inventory Manager Knew: Value of Visibility and RFID under Imperfect Inventory Information. Retrieved February 17, 2014, from http://ssrn.com/abstract=1351606 or http://dx.doi.org/10.2139/ssrn.1351606

Eckert, S. G. (2007). *Inventory Management and Its Effects on Customer*. Retrieved MArch 24, 2014 from http://scap.pk/article/Inventory%20Management%20and%20Its%20Effects%20on%20Customer%20Satisfaction.pdf

Inventory System Overview. (2014). Retrieved March 24, 2014 from ASAP Systems: http://www.asapsystems.com/inventory_control.php

Napolitano, & Maida. (2012, March 1). *Top 8 guidelines to improve inventory management*. Retrieved from Modern Material Handling: http://www.mmh.com/article/top_8_guidelines_to_improve_inventory_management

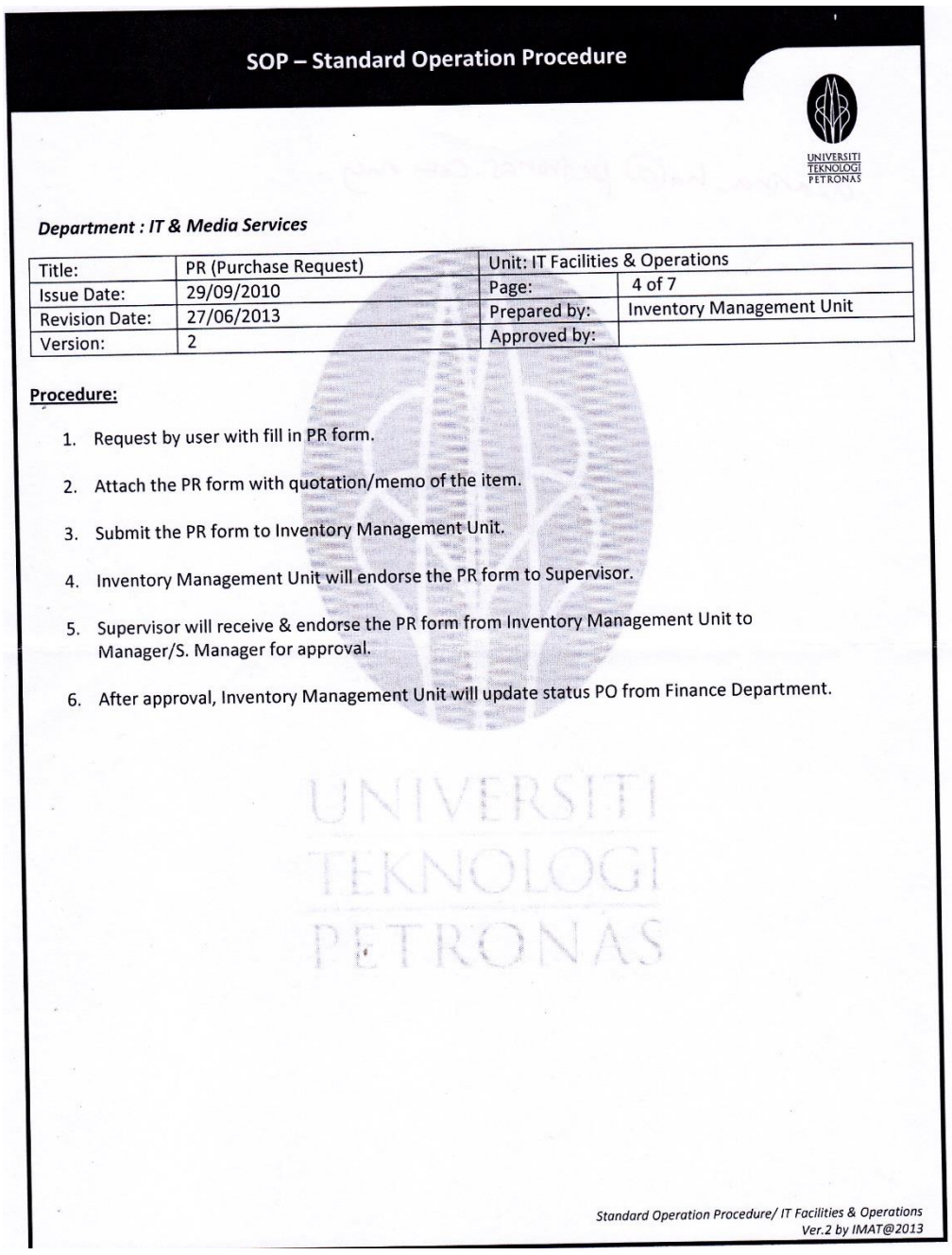
Ohashi, K., Ota, S., Ohno-Machado, L., & Tanaka, H. (2008). *Comparison of RFID Systems for Tracking Clinical Interventions at the Bedside.* Retrieved from NCBI: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2656010/

Olson, M. H., & Lucas Jr., H. C. (1982, November). *The Impact of Office Automation on the Organization: Some Implications For Research and Practice.* (R. Kling, Ed.) Retrieved February 16, 2014, from https://archive.nyu.edu/: https://archive.nyu.edu/bitstream/2451/14762/1/IS-80-046.pdf

Shukla, K. K., & Radadiya, B. (2013). Comparative Study of Active RFID and Passive RFID Technologies in Context of Electronic Toll Collection (ETC) System. *3*(3), 1-2. Retrieved 2 18, 2014, from http://www.theglobaljournals.com/ijar/file.php?val=MTEwOQ==

APPENDICES

APPENDIX I : Current Standard Operation Procedure (SOP)



SOP – Standard Operation Procedure

UNIVERSITI TEKNOLOGI PETRONAS

Department : IT & Media Services

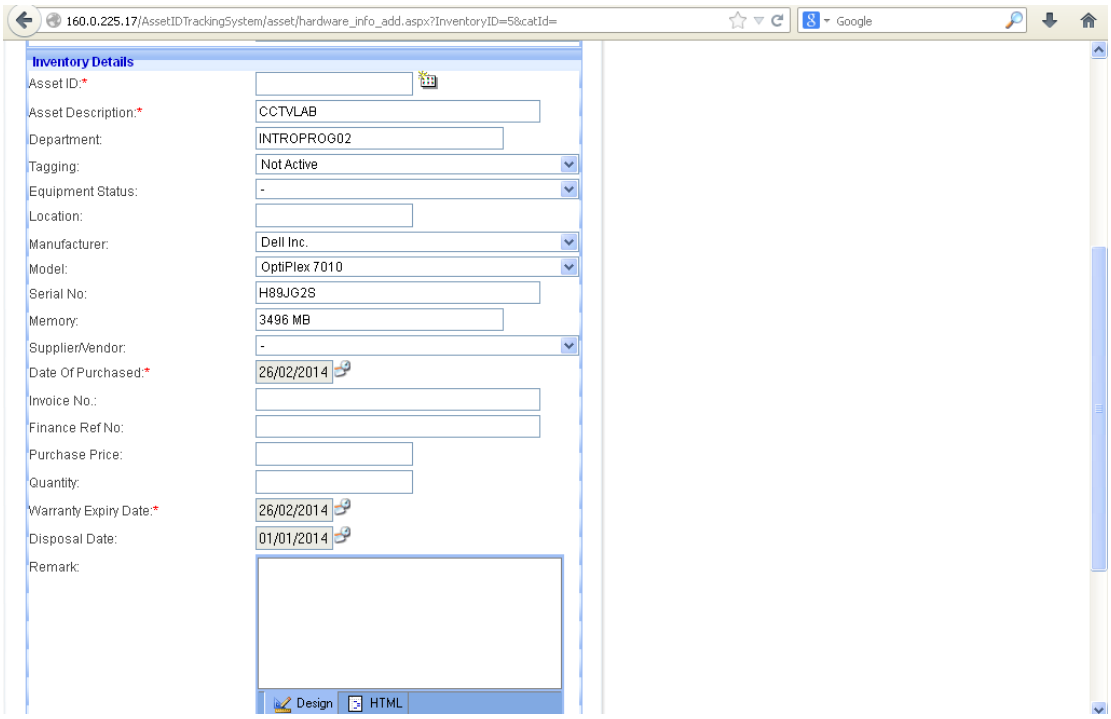
Title:	PR (Purchase Request)	Unit: IT Facilities & Operations	
Issue Date:	29/09/2010	Page:	4 of 7
Revision Date:	27/06/2013	Prepared by:	Inventory Management Unit
Version:	2	Approved by:	

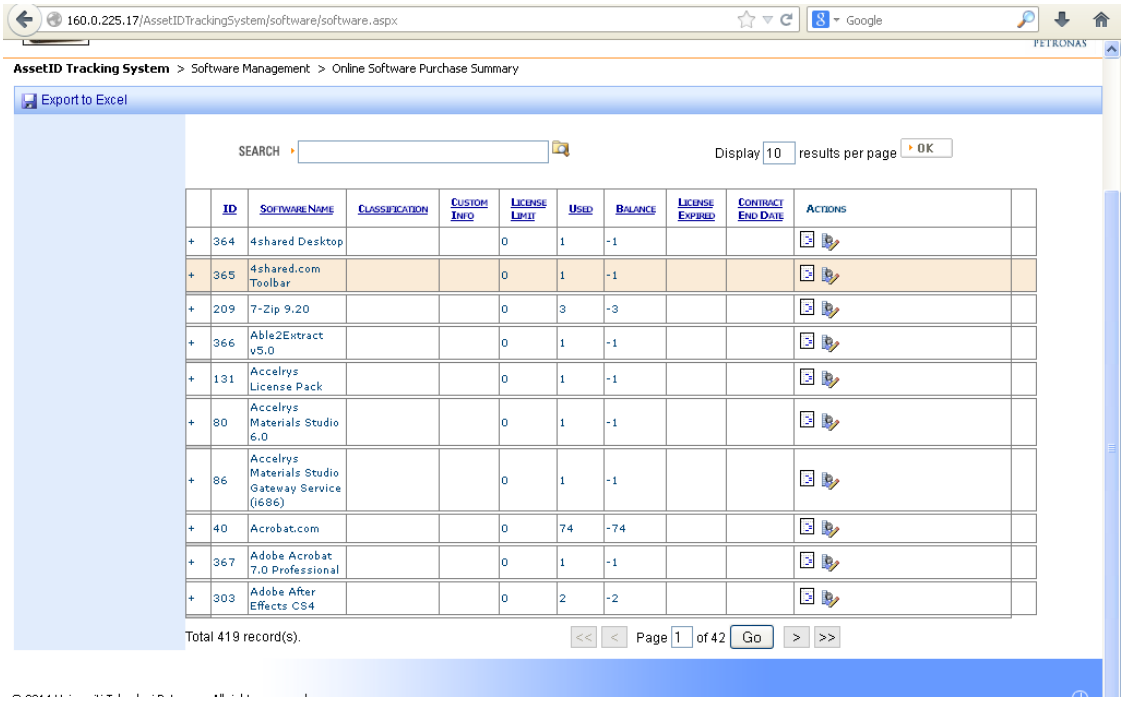
Procedure:

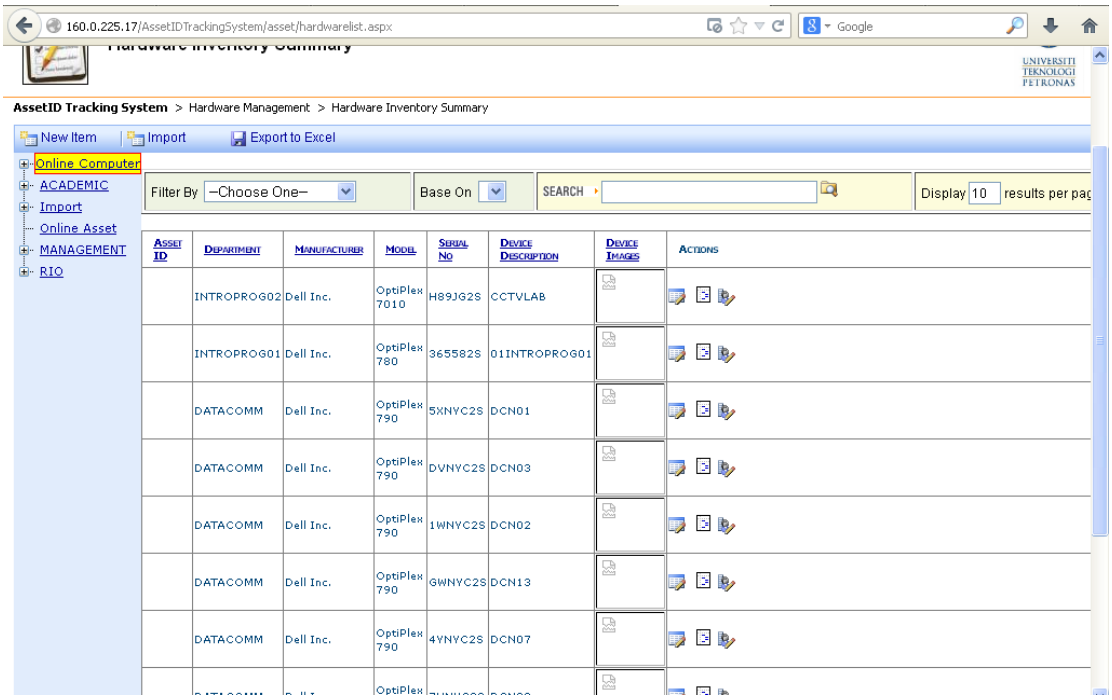
1. Request by user with fill in PR form.
2. Attach the PR form with quotation/memo of the item.
3. Submit the PR form to Inventory Management Unit.
4. Inventory Management Unit will endorse the PR form to Supervisor.
5. Supervisor will receive & endorse the PR form from Inventory Management Unit to Manager/S. Manager for approval.
6. After approval, Inventory Management Unit will update status PO from Finance Department.

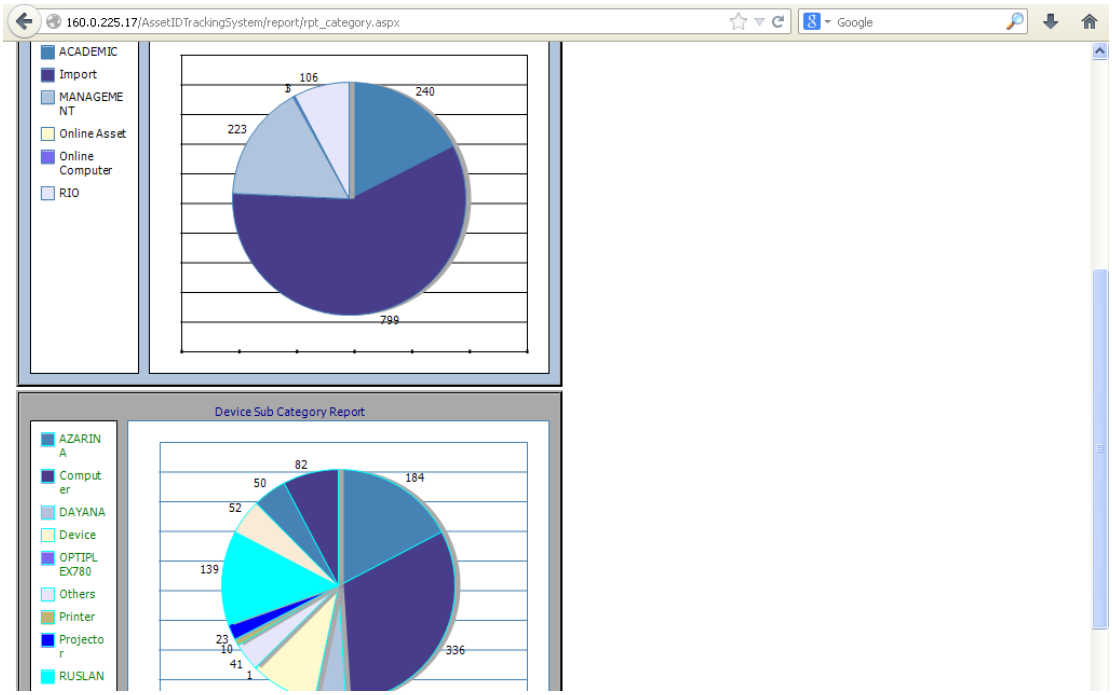
Standard Operation Procedure/ IT Facilities & Operations
Ver.2 by IMAT@2013

APPENDIX II: Existing System screenshot






160.0.225.17/AssetIDTrackingSystem/asset/hardwarelist.aspx
Google
Hardware Inventory Summary
UNIVERSITI TEKNOLOGI PETRONAS
AssetID Tracking System > Hardware Management > Hardware Inventory Summary
New Item
Import
Export to Excel
Online Computer
ACADEMIC
Import
Online Asset
MANAGEMENT
RIO
Filter By –Choose One–
Base On
SEARCH
Display 10 results per pag
Asset ID
Department
Manufacturer
Model
Serial No
Device Description
Device Images
Actions
INTROPROG02 Dell Inc. OptiPlex 7010 H89JG2S CCTVLAB
INTROPROG01 Dell Inc. OptiPlex 780 365582S 01INTROPROG01
DATACOMM Dell Inc. OptiPlex 790 5XNYC2S DCN01
DATACOMM Dell Inc. OptiPlex 790 DVNYC2S DCN03
DATACOMM Dell Inc. OptiPlex 790 1WNYC2S DCN02
DATACOMM Dell Inc. OptiPlex 790 GWNYC2S DCN13
DATACOMM Dell Inc. OptiPlex 790 4YNYC2S DCN07


160.0.225.17/AssetIDTrackingSystem/report/rpt_category.aspx
Google
ACADEMIC
Import
MANAGEMENT
Online Asset
Online Computer
RIO
106
8
240
223
799
Device Sub Category Report
AZARINA
Computer
DAYANA
Device
OPTIPLEX780
Others
Printer
Projector
RUSLAN
82
50
184
52
139
23
10
41
1
336

APPENDIX III: Coding

register_hardware.php

```
<?php
$con = mysql_connect("localhost","root","");
mysql_select_db("labinventory") or die("Database does not exists.");
if (!$con)
  {
  die('Could not connect: ' . mysql_error());
  }
if (isset($_POST['submit'])){
$assetid=mysql_escape_string($_POST['assetid']);
$description=mysql_escape_string($_POST['description']);
$dept=mysql_escape_string($_POST['dept']);
$status=$_POST['status'];
$manufacturer=mysql_escape_string($_POST['manufacturer']);
$model=($_POST['model']);
$serialno=mysql_escape_string($_POST['serialno']);
$supplier=($_POST['supplier']);
$datep=mysql_escape_string($_POST['datepurchased']);
$invoiceno=mysql_escape_string($_POST['invoiceno']);
$price=mysql_escape_string($_POST['price']);
$warrantydate=mysql_escape_string($_POST['warrantydate']);
$datedisposal=mysql_escape_string($_POST['datedisposal']);
$location=mysql_escape_string($_POST['location']);


if      (!$_POST['assetid']       |       !$_POST['datepurchased']||       !$_POST['dept']|
!$_POST['manufacturer']| !$_POST['model']| !$_POST['serialno']| !$_POST['warrantydate'])
 {
echo ("<SCRIPT LANGUAGE='JavaScript'>
        window.alert('You did not complete all of the required fields')
        window.location.href='add_hardware.php'
        </SCRIPT>");
exit();
}
else{
```

```
$result=mysql_query("SELECT `assetid` FROM `hardware` WHERE `assetid` = '$assetid'") or
die(mysql_error());

if(mysql_num_rows($result) > 0){

                echo ("<SCRIPT LANGUAGE='JavaScript'>

        window.alert('Asset ID already exist. Please enter again')

        window.location.href='add_hardware.php'

        </SCRIPT>");

}

else{

$sql="INSERT INTO `hardware`(`AssetID`, `Description`, `Dept`, `Status`, `Manufacturer`,
`Model`,    `SerialNo`,    `Supplier`,    `DateP`,    `InvoiceNo`,    `Price`,    `Warranty`,
`DateDisposal`, `Location`)

VALUES  ('$assetid',  '$description',  '$dept',  '$status',  '$manufacturer',  '$model',
'$serialno',    '$supplier',    '$datep',    '$invoiceno',    '$price',    '$warrantydate',
'$datedisposal', '$location')";

if (!mysql_query($sql)) {

  die('Error: ' . mysql_error($con));

}

echo ("<SCRIPT LANGUAGE='JavaScript'>

        window.alert('1 Record have been added')

        window.location.href='add_hardware.php'

        </SCRIPT>");

}

mysql_close();


exit();

}}

?>
```

register_software.php

```
<?php
$con = mysql_connect("localhost","root","");
mysql_select_db("labinventory") or die("Database does not exists.");
if (!$con)
  {
  die('Could not connect: ' . mysql_error());
  }
if (isset($_POST['submit'])){
$id=mysql_escape_string($_POST['id']);
$name=$_POST['name'];
$class=mysql_escape_string($_POST['class']);
$custom=mysql_escape_string($_POST['custom']);
$limit=mysql_escape_string($_POST['limit']);
$used=mysql_escape_string($_POST['used']);
$expiry=mysql_escape_string($_POST['expiry']);
$contract=mysql_escape_string($_POST['contract']);
}
if (!$_POST['id'] | !$_POST['name']| !$_POST['used'])
 {
echo ("<SCRIPT LANGUAGE='JavaScript'>
        window.alert('You did not complete all of the required fields')
        window.location.href='add_software.php'
        </SCRIPT>");
exit();
}
else{
$result=mysql_query("SELECT `id` FROM `software` WHERE `id` = '$id'") or
die(mysql_error());
if(mysql_num_rows($result) > 0){
                echo ("<SCRIPT LANGUAGE='JavaScript'>
        window.alert('Asset ID already exist. Please enter again')
        window.location.href='add_hardware.php'
        </SCRIPT>");
}
else{
```

```
$sql="INSERT INTO `software`(`id`, `name`, `classification`, `info`, `limit`, `used`, `expiry`, `contract`)

VALUES ('$id', '$name', '$class', '$custom', '$limit', '$used', '$expiry', '$contract')";

if (!mysql_query($sql)) {

  die('Error: ' . mysql_error($con));

}

else{

echo ("<SCRIPT LANGUAGE='JavaScript'>

        window.alert('1 Record have been added')

        window.location.href='add_software.php'

        </SCRIPT>");

}

mysql_close();


exit();

}}

?>
```

Track.php

```
<?php

if(isset($_POST['submit'])){

$assetid=$_POST['assetid'];

//connect  to the database

$db=mysql_connect("localhost","root","") or die ('I cannot connect  to the database
because: ' . mysql_error());

mysql_select_db("labinventory") or die("Database does not exists.");

$sql="SELECT `assetid` FROM `hardware` WHERE  `assetid` = '$assetid'" or
die(mysql_error());

$result=mysql_query($sql)or die(mysql_error());

$count=mysql_num_rows($result);

if ($count==1){

$_SESSION['assetid']=$assetid;

//echo $row['AssetID'];

        echo ("<SCRIPT LANGUAGE='JavaScript'>

         window.alert('Inventory Found')

         window.location.href='track_result.php?assetid=".$assetid."'

         </SCRIPT>");

}

else{   echo ("<SCRIPT LANGUAGE='JavaScript'>

         window.alert('Inventory Not Found. Please enter again.')

                window.location.href='track.php'

         </SCRIPT>");

}

        }?>
```

Update.php

```
<?php

session_start();

if (isset($_POST['submit'])){

$assetid=$_SESSION['assetid'];

$description=mysql_escape_string($_POST['description']);

$dept=mysql_escape_string($_POST['department']);

$status=$_POST['status'];

$manufacturer=$_POST['manufacturer'];

$model=$_POST['model'];

$serialno=mysql_escape_string($_POST['serialno']);

$supplier=$_POST['supplier'];

$datep=mysql_escape_string($_POST['dateP']);

$invoiceno=mysql_escape_string($_POST['invoiceNo']);

$price=mysql_escape_string($_POST['price']);

$warrantydate=mysql_escape_string($_POST['warranty']);

$datedisposal=mysql_escape_string($_POST['dateDisposal']);

$location=mysql_escape_string($_POST['location']);


$con = mysql_connect("localhost","root","");

mysql_select_db("labinventory") or die("Database does not exists.");

if (!$con)

  {

  die('Could not connect: ' . mysql_error());

  }

$sql="UPDATE Hardware

SET `AssetID`='$assetid',`Description`='$description',`Dept`='$dept', `Status`='$status',
`Manufacturer`='$manufacturer',          `Model`='$model',          `SerialNo`='$serialno',
`Supplier`='$supplier',  `DateP`='$datep',  `InvoiceNo`='$invoiceno',  `Price`='$price',
`Warranty`='$warrantydate', `DateDisposal`='$datedisposal', `Location`='$location'

WHERE `AssetID` = '$assetid'";

mysql_query($sql);

if (!mysql_query($sql)) {

die('Error: ' . mysql_error($con));

}

echo ("<SCRIPT LANGUAGE='JavaScript'>
```

```
        window.alert('1 Record Updated')
        window.location.href='display_hardware.php'
        </SCRIPT>");

mysql_close();

}
?>
```

Display.php

```
<?php
$con=mysql_connect("localhost","root","");
mysql_select_db("labinventory") or die("Database does not exists.");

$start=0;
$limit=10;
$pagenum=1;
$page_name="display_hardware.php";
if(isset($_GET['pagenum'])){
$pagenum=$_GET['pagenum'];
}
if($pagenum>1){
$start=($pagenum-1)*$limit;
}
$query1 = "SELECT * FROM hardware";
$count = mysql_query($query1) or die ("Database does not exists.");
$total = mysql_num_rows($count) or die("1");
$last= ceil($total/$limit);

$result_p = mysql_query("SELECT * FROM hardware LIMIT $start, $limit") or die(mysql_error());
?>

<h1>INVENTORY DETAILS: HARDWARE</h1>
<br>
<br>
<table align = "center">
<tr>
<th>ASSET ID</th>
<th>STATUS</th>
<th>MANUFACTURER</th>
<th>MODEL</th>
<th>LOCATION</th>
<th>MANAGE</th>
</tr>
```

```
<?php

while($info = mysql_fetch_array($result_p)) {

?>

<tr>

<td> <?php echo  $info['AssetID']  ?></td>


<td bgcolor=""><font color=""><?php echo $info['Status'] ?></font></td>


<td> <?php echo $info['Manufacturer'] ?></td>

<td> <?php echo $info['Model'] ?></td>

<td> <?php echo $info['Location'] ?></td>

<td>

<a href="track_result.php?assetid=<?php echo  $info['AssetID'] ?>">edit</a>

 | <a href="remove.php?val=<?php echo   $info['AssetID']."& table=hardware&col=assetid"
?>">remove</a>

</td>

</tr>

<?php }

?>

</table>

<?php

echo "<p>Page ". $pagenum." of ".$last."<p>";

echo "<font>Go to: </font>";

for ($i=1; $i<=$last; $i++){

echo          "<a          href='$page_name?pagenum=".$i."'><font          face='Verdana'
size='2'>".$i."</font></a>";

if($i!=$last){

echo "<font>, </font>";

}

}

?>

</div>
```